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THE PRACTICAL APPLICATION OF VITAL STATISTICS.

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The Committee of the American Health Association on Demography and Vital Statistics in their Sanitary Relations, in a report made in 1902, spoke as follows:—

"Deaths are registered primarily for legal purposes; that is, for the protection of certain rights and privileges of individuals and of families. This is the first and most important use of records of deaths, and the sort of utility which appeals most strongly to the general public wherever such records have been long kept. A subsidiary, though highly valuable, use of registration is for the compilation of sanitary statistics, by which the local, State, and Federal health services may direct their measures, improve their methods, and measure their results."

I am now somewhat inclined to resent the action of our committee—of which, however, I was an assenting member when this report was made—in asserting that the use of registration as a source of vital statistics is subsidiary to its use for legal purposes. Surely, if the health of the people should be the chief concern of the stateman, as has been wisely said, and if vital statistics serve to increase the efficiency of measures tending to preserve and to promote such health, the importance of registration is greater from a statistical standpoint than from the standpoint of the mere legal interests of an occasional individual or the occasional legal interests of the community as a whole. It may well be conceived that our committee had in mind, when it wrote its report, the actual extent and manner in which vital statistics are now used as indexes to the state of public health and as guides to sanitary effort rather than the extent to which they are susceptible of such use and the extent to which they should be so used. As yet, it seems to me, vital statistics serve but meagrely the ends of sanitation, and even by many professed sanitarians the possibilities for good which they contain are but poorly comprehended. Neither, I might add on the other hand, are the difficulties in the way of practical realization of such possibilities always comprehended.

The birth-rate is of interest chiefly from a sociological standpoint. Death-rates, general and special, and morbidity rates must be relied upon to show where and how sanitary work is needed, and to show the results of sanitary work already under way, and with death and morbidity rates, therefore, we are chiefly concerned. Nowhere do the sanitary possibilities in vital statistics, and the difficulties in the way of their realization, become more apparent than in the study of the general death-rate, the popularly accepted index to the healthfulness of the community. For the death-rate of a community depends upon but four primary factors: first, an arbitrarily fixed unit of space; second, an arbitrarily fixed unit of time; third, the number of people; and, fourth, the number of deaths. And to the uninitiated it indicates well the sanitary condition. The secondary factors are, however, unfortunately almost innumerable. The number of deaths depends not merely upon the sanitary condition of the locality, or, speaking more broadly, upon its salubrity, but depends also upon the resistance of the individuals of whom the community is composed. When we go further and undertake to analyze the factors that go to make up salubrity, we find that they include the most varied conditions, as, for instance, the character and extent of changes of temperature, of prevailing winds, and of humidity; the character of soil; drainage, both artificial and natural; the character and location of dwellings; kinds of occupations; quality and availability of food supply and of water supply; the removal and disposal of wastes; and probably numerous other factors, all going to make up the entity that we call environment. And the variations in the character of the population which go to the determination of its resisting qualities are equally numerous,—age composition, racial factors, distribution by sex, intelligence, financial status, heredity, and so on. The slightest consideration must be sufficient, therefore, to show that, before the significance of a death-rate can be discovered, all of the factors and sub-factors that have been referred to, and probably others that have escaped mention, must be carefully investigated and evaluated. Only after this has been done for the same community from year to year, and after it has been done for various communities during corresponding periods, may it be possible to account, in part at least, for variations in the death-rate and to utilize the information thus obtained as a proper basis for action.

The greatest difficulty in determining the true value and the significance of the death-rate, along the lines laid down above, lies in the infrequency and incompleteness of census returns in so far as they relate to population. Returns of deaths may be sufficiently full and accurate to provide all data essential for work, but before different death-rates can be properly calculated, and their significance determined, it is necessary to have census returns for the same period compiled with equal fulness and accuracy and embodying corresponding data. It is not enough for the purposes of the health officer to know that in the territory under his jurisdiction more deaths occur during one period than during another, but he must also know the causes of such deaths, and whether the fatalities were evenly distributed throughout the community or occurred in particular places or among particular classes of the population; and if the increase occurred with respect to certain diseases alone, or over limited areas, or in limited classes, he must be able to determine whether the increase was due to an increase in the population susceptible to that particular disease, or in the population living in that particular locality, or the population belonging to that particular class. If it was not due to an increase in the susceptible population, then by comparing those places and those classes in which it occurred with other places and classes showing similar mortality, and with places and classes in which it did not occur, he may ultimately learn something of the conditions leading to such increased mortality and discover means by which it may be prevented.

To carry this system to its logical conclusion, sanitary officers should have authority to require from time to time as investigations are under way, the reporting not merely of cases of death, as is now done, but also cases of disease, whether contagious or non-contagious. Investigations based upon reports of deaths alone cover relatively too small a number of cases to give the best results, and, moreover, fatal cases come to the knowledge of the sanitary authority in many instances too late to permit proper inquiry to be made as to the causes of the disease. It is probably only through some such systematic investigation of cases of non-contagious diseases, such as chronic nephritis, for instance, during the life of the patient, that the cause and method of prevention will be found.

Investigations such as have been suggested cannot be made through the mere compilation of vital statistics, but will depend largely on the analysis of the data which they contain. And for the purpose of furthering such analysis it will probably be found essential that trained investigators examine returns as they come in and supplement at once the information which they contain by information collected by personal investigation, if such added information is necessary to the proper classification and study of the case. Every record made should be carefully scrutinized at the time of its receipt to determine its sufficiency for purposes of the ultimate analysis to which it will be subjected, and any deficiencies should be supplied at once. To undertake to determine the condition of a community with respect to its health by mere office examination of written reports, without direct personal contact with the case reported and even without direct personal contact with those by whom such reports are made, is a more impracticable method of solving the grave sanitary problem that presents itself to the health officer than it would be for a chemist or a bacteriologist to undertake to determine the nature of chemical reactions or to determine the life histories of bacteria by simply scrutinizing reports filed under similar circumstances. Work in the office must be supplemented by work in the laboratory and in the field, and in this case the community itself is the laboratory and the field in which the work must be done.

In order, then, that the greatest value may be obtained from the vital statistics that are being more and more extensively compiled every day, more attention must be paid to the scientific analysis of such statistics, not as mere figures but as scientific facts, so that they may actually afford a proper basis for rational sanitary measures rather than serve merely to flatter the community into a condition of self-complacency when the rates go down and to frighten it into a state of panic when they go upward.